

Ready·Sep·Go

Fast and Easy Isolation of Natural Killer Cells

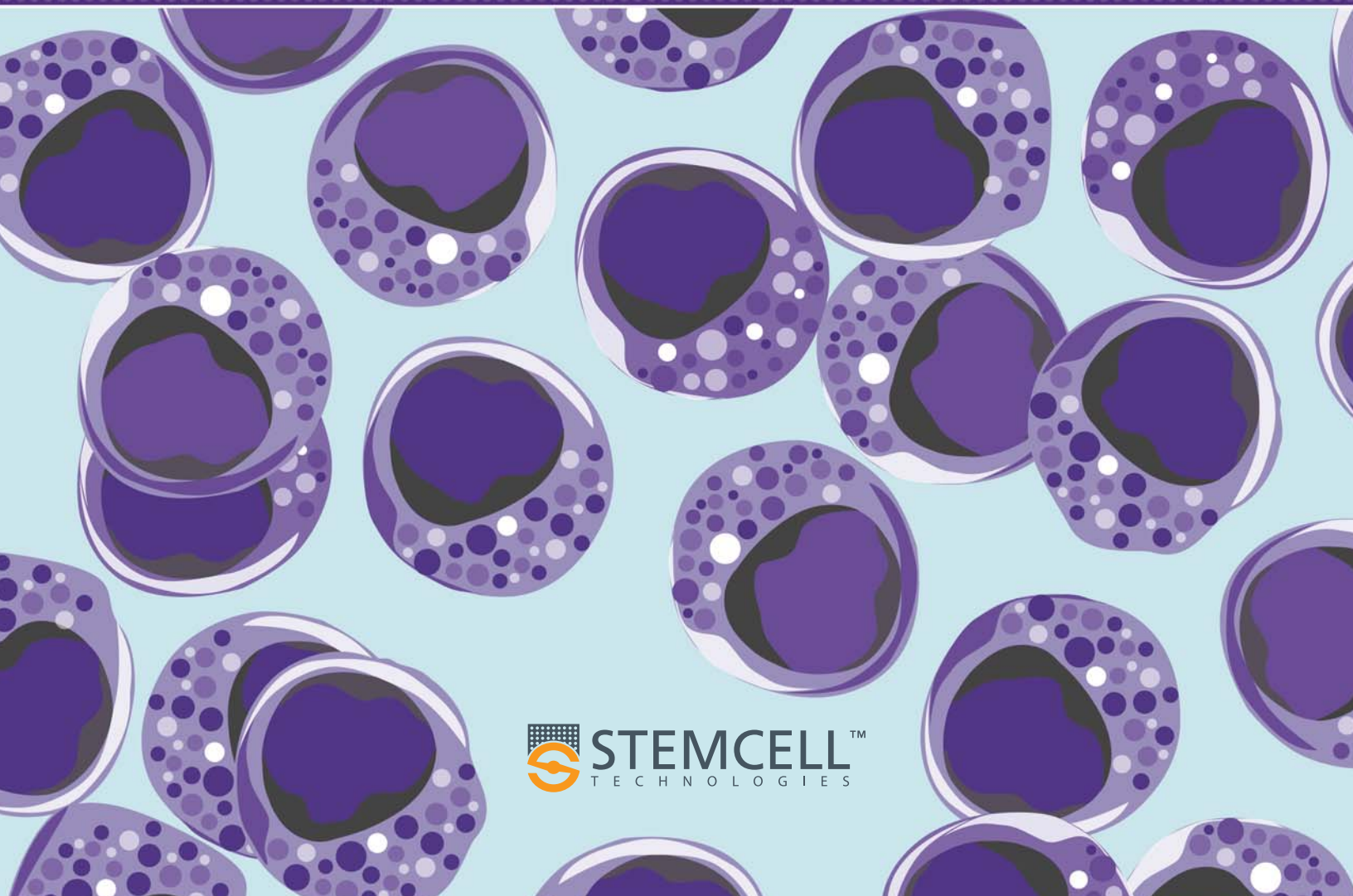


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Cutting Edge NK Cell Research

Begins With Fast and Easy NK Cell Isolation

Natural Killer (NK) cells are vital contributors to the innate immune system. Despite lacking conventional antigen specificity, NK cells can display cytotoxic activity against “altered self” (virus-infected and cancerous) cells by receiving the appropriate signals from complex, NK-specific ligand-receptor interactions.¹ They can also produce potent immunoregulatory cytokines that modulate the adaptive immune response, and thus serve as interesting candidates for cancer or viral immunotherapy.¹

NK cells comprise a rare subset of lymphocytes, with polymorphic receptor expression. As cell isolation procedures generally depend on the expression of cell-type specific antigens, the isolation of NK cells for study must therefore be approached with care. With the unique cell separation platforms EasySep™ and RosetteSep™, STEMCELL Technologies supports your cutting-edge NK cell research.

NK cells isolated with kits from STEMCELL Technologies have been used in publications that:

- Define and characterize novel NK cell markers^{2,3}
- Investigate the anti-leukemic potential of alloreactive NK cells⁴
- Discover antibody-NK cell interactions that enhance HIV neutralization⁵
- Analyze the impact of specific drugs on NK cell function⁶
- Identify novel mechanisms for NK cell – effector T cell interactions⁷

Ready·Sep·Go

Isolate NK Cells In As Little As 25 Minutes

- No columns, no washes.
- Up to 96% purified human NK cells.
- Up to 80% recovery of functional NK cells.
- Untouched cells are particle- and antibody-free.

WALLCHART

Natural Killer Cells (Nature Reviews Immunology)

www.stemcell.com/NKWallchart

SCAN ME ▶



1. Vivier E, et al. Nat. Immunol. 9:503-8, 2008
2. Della Chiesa M, et al. Int Immunol. 22(2):91-100, 2010
3. Yu J, et al. Blood. 115(2):274-81, 2010
4. Pende D, et al. Blood. 113(13):3119-29, 2009
5. Forthal DN, et al. J Virol. 79(4):2042-9, 2005
6. Sand KL, et al. Cell Mol Life Sci. 66(8):1446-56, 2009
7. Domaica CI, et al. EMBO Rep. 10(8):908-15, 2009

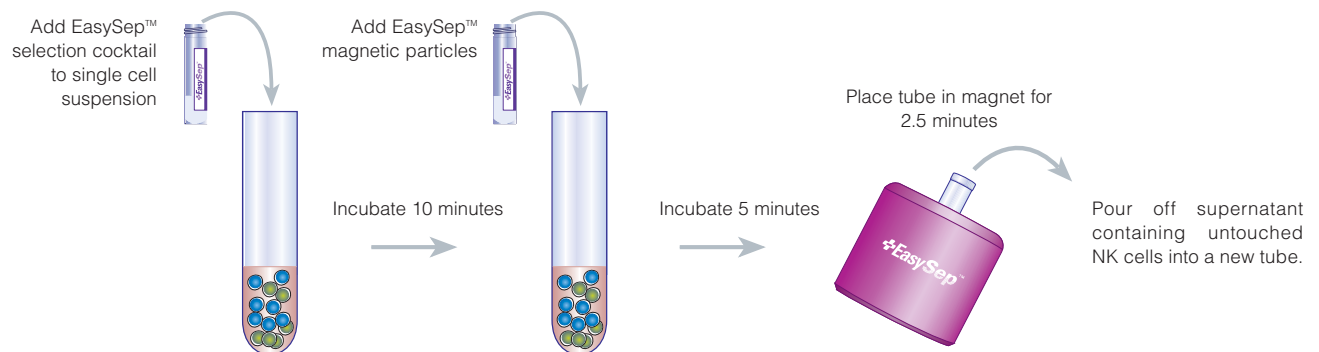




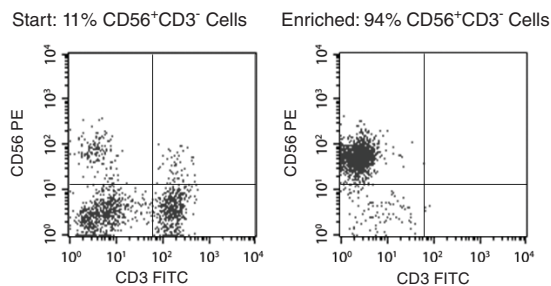
Immunomagnetic NK Cell Isolation

The EasySep™ NK Cell Enrichment Kits provide high NK cell purity and recovery rates from a variety of sources, including fresh or frozen peripheral blood mononuclear cell (PBMC) samples, leukapheresis products, buffy coats or spleen. Cells are crosslinked to EasySep™ magnetic particles using our Tetrameric Antibody Complex (TAC) technology, and then separated from the sample with an EasySep™ magnet without the use of columns.

EasySep™ Human NK Cell Enrichment Procedure

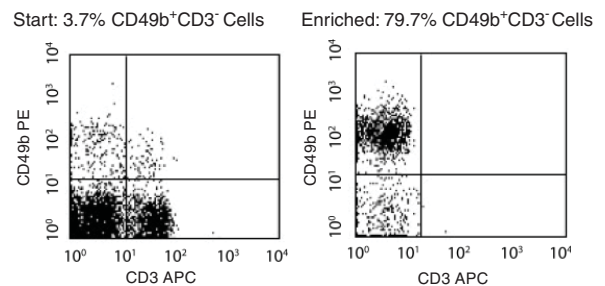


Typical EasySep™ Human NK Cell Enrichment Profile



Starting with previously frozen mononuclear cells containing >10% NK cells, the enriched fraction typically contains 73 - 95% NK cells. Purities may be lower when starting with samples containing <10% NK cells.

Typical EasySep™ Mouse NK Cell Enrichment Profile



Starting with C57BL6 mouse splenocytes, the CD49b⁺CD3⁻ cell content of the enriched fraction typically ranges from 75 - 87%.

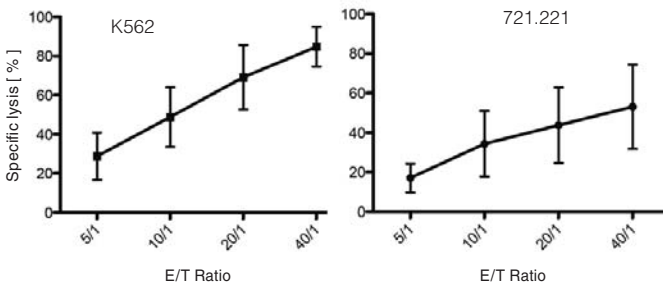
Positive Selection of NK Cells

Highly purified NK cells can also be obtained from a variety of sources with the EasySep™ positive selection kits for human and mouse NK cells, which isolate cells expressing CD56 and CD49b, respectively. EasySep™ particles are flow-compatible, enabling purified cells to be used directly for flow cytometric analysis or downstream cytotoxicity assays, as well as for cloning and gene expression profiling.

Functional NK Cells

Untouched Cells Isolated With EasySep™

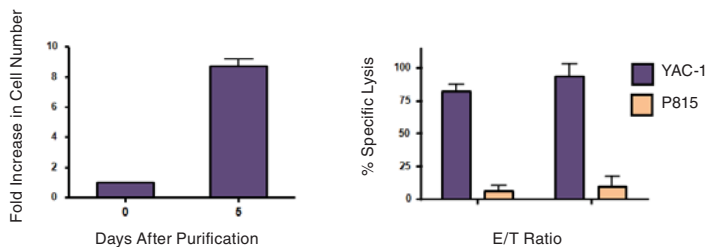
Untouched Human NK Cells Retain Lytic Activity



Resting NK cells (without IL-2 stimulation) were isolated with the EasySep™ Human NK Cell Enrichment Kit and used immediately in independent killing assays against the K562 and 721.221 target cell lines (E/T Ratio: Effector/Target cell ratio).

Functional data generously provided by Dr. Catharina Gross from the laboratory of Dr. Eric Long (NIAID, NIH).

Untouched Mouse NK Cells Lyse Targets After Expansion



Left: Mouse NK cells isolated with EasySep™ Mouse NK Cell Enrichment Kit proliferate when cultured in complete medium supplemented with IL-2.

Right: The expanded NK cells display NK cell-mediated cytotoxicity and target specificity in a 4-hour ⁵¹Cr release assay. YAC-1 is a mouse cell line sensitive to NK-mediated cytotoxicity while P815 is NK cytotoxicity-resistant.

Functional data generously provided by Dr. Catharina Gross from the laboratory of Dr. Eric Long (NIAID, NIH).

ROBOSEP™

Fully Automated NK Cell Isolation



Streamline your NK cell isolations using RoboSep™, the fully automated cell separator. By performing all EasySep™ cell labeling and separation steps, RoboSep™ maintains the speed and simplicity of EasySep™ while enabling the high-throughput, versatile isolation of highly purified cells, which minimizes sample handling and eliminates cross-contamination.

Did You Know?

Human NK cells can be purified directly from fresh leukapheresis samples using the EasySep™ Human NK Cell Enrichment Kit **without** prior density centrifugation (e.g. Ficoll™), saving you even more time.



One-Step Human NK Cell Isolation From Whole Blood

Isolate purified, untouched human NK cells directly from whole blood during a standard density centrifugation with RosetteSep™. RosetteSep™ crosslinks unwanted cells to red blood cells present in the sample to form immunorosettes. When centrifuged over a density medium (e.g. Ficoll-Paque™), unwanted cells pellet along with the red blood cells, leaving highly purified NK cells at the interface between the plasma and the density medium.

By combining NK cell isolation with density centrifugation, RosetteSep™ eliminates the need for a separate magnetic separation step, reducing handling time, removing a source of cell loss, and maximizing convenience.

RosetteSep™ Human NK Cell Enrichment Procedure

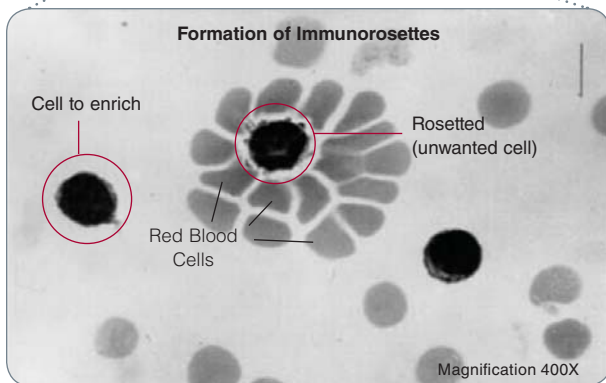
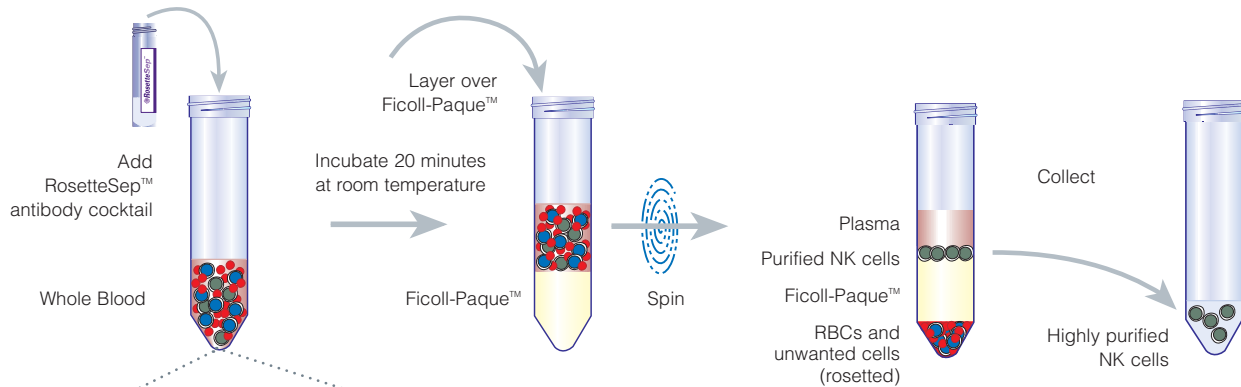
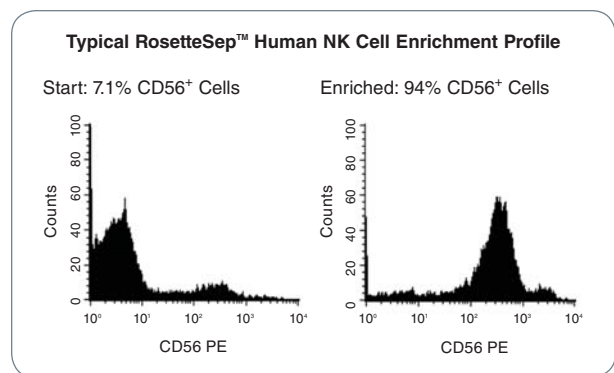


Image of a blood sample after addition of the RosetteSep™ cocktail, and prior to centrifugation over Ficoll™.



Starting with fresh peripheral blood, the CD56⁺ cell content of the enriched fraction typically ranges from 80 - 98%. Red blood cells were removed by lysis prior to flow cytometry.

Did You Know?

Although RosetteSep™ has been optimized for use with whole blood, cells can be enriched from other sources (for example, buffy coat or leukapheresis samples). The concentration of nucleated cells in the sample should not exceed 5×10^7 cells/mL, and red blood cells (RBCs) should be present at a ratio of at least 30 - 50 RBCs per nucleated cell.

Products for NK Cell Isolation

SPECIES	STARTING SAMPLE	SELECTION	PRODUCT	CATALOG #
Human	Whole Blood or Buffy Coat	Negative	RosetteSep™ Human NK Cell Enrichment Cocktail	15065
	PBMC or Leukapheresis Product	Negative	EasySep™ Human NK Cell Enrichment Kit	19055
	PBMC	Positive	EasySep™ Human CD56 Positive Selection Kit	18055
	Buffy Coat	Positive	EasySep™ Human Buffy Coat CD56 Positive Selection Kit	18085
Mouse	Spleen or Other Tissues	Negative	EasySep™ Mouse NK Cell Enrichment Kit	19755
		Positive	EasySep™ Mouse NK Cell Positive Selection Kit	18755

Selected Recent Publications

EasySep™ Human NK Cell Enrichment Kit (#19055)

- Magri G, et al. Blood 117(3): 848-856, 2011
- Melki MT, et al. PLoS Pathog 6(4):e1000862, 2010
- Mian MF, et al. Mol Ther 18(7):1379-88, 2010
- Bernstein HB, et al. Virol 387(1): 59-66, 2009
- Conry SJ, et al. J. Virol 83(21): 11175-87, 2009
- Crane CA, et al. Neuro Oncol 12(1): 7-13, 2009
- Sand KL, et al. Cell Mol Life Sci 66(8): 1446-56, 2009
- Viaud S, et al. PLoS ONE 4(3): e4942, 2009
- Fogli M, et al. PLoS Pathog 4(7): 1-13, 2008
- Marcondes AM, et al. Proc Natl Acad Sci USA 105(8):2865-70, 2008
- Bernstein HB, et al. J Immunol 177 (6): 3669-76, 2006

EasySep™ Mouse NK Cell Enrichment Kit (#19755)

- Bouchentouf M, et al. J Immunol 185(11): 7014-7025, 2010
- Tran J, et al. Vaccine 28(22): 3767-3772, 2010
- Kawakami Y, et al. J Exp Med 206: 1219-25, 2009

RosetteSep™ NK Cell Enrichment Cocktail (#15065)

- Benson Jr DM, et al. Blood 113(12): 2706-14, 2009
- Pende D, et al. Blood 113(13): 3119-29, 2009
- Yu J, et al. Blood 115(2): 274-81, 2009
- Fuertes MB, et al. J. Immunol 180: 4606-14, 2008
- Giuliani M, et al. PLoS ONE 3(5):e2241, 2008
- Li C, et al. Proc Natl Acad Sci USA 105(8):3017-22, 2008
- Müller T, et al. Cancer Immunol Immunother 57(3):411-23. 2008
- Ruggeri L, et al. Blood 110(1): 433-440, 2007
- Girart MV, et al. J Immunol 179: 3472-79, 2007
- Della Chiesa M, et al. Blood 108(13): 4118-25, 2006
- Roda JM, et al. J Immunol 177(1): 120-9, 2006
- Marcenaro S, et al. Blood 108(7): 2316-23, 2006

Did You Know?

STEMCELL Technologies' NK cell isolation kits are easily customizable. Contact techsupport@stemcell.com to discuss with our team of technical experts and find the antibodies and methods you need to develop your ideal NK cell isolation procedure.

▶
VIDEO

Fast and Easy Isolation of Untouched NK Cells

www.stemcell.com/NKVideo

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